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## **A Review of the Eleutherodactylid Frog Genus *Microbatrachylus* (Leptodactylidae)**

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The inter- and intrarelationships of the leptodactylid genera *Eleutherodactylus*, *Syrrophus*, *Tomodactylus* and *Microbatrachylus* are by no means clearly understood in Mexico at this time. It is the purpose of the present review to clarify the situation in part.

It has been largely accepted, principally due to the various works of E. H. Taylor on Mexican amphibians, that the above mentioned genera are related to *Eleutherodactylus* through the *Eleutherodactylus mexicanus* group which Taylor reviewed in 1941. The group was diagnosed as possessing the following characters : inguinal gland ; no tarsal tubercle or fold ; a large inner metatarsal tubercle ; and complete absence of webs. In addition, the various forms usually have a greatly reduced vomerine dentition although in one species these structures are especially well developed.

In reality the inguinal gland is by no means as restricted in distribution as one might be led to believe. All specimens of *E. mexicanus*, *E. occidentalis*, *E. calcitrans*, *E. saltator*, and *E. greggi* which I have examined (in excess of 300) possess this gland and a similar gland is evident in the axillary area, in many cases. In *Eleutherodactylus rugulosus*, inguinal glands have been noted in individuals occurring at high altitudes (2200m.) , whereas in specimens from lower elevations the gland is lacking. Furthermore, Schwartz (1960: 35) has pointed out that inguinal glands may be present or absent in specimens of *E. zugi* (Cuba) . The *E. alfredi* (*E. spatulatus* of Duellman, 1960) group also frequently shows these glands as seen in a series of *E. spatulatus* from above Vista Hermosa, Oaxaca, collected at elevations of between 1000 and 1700 meters. However, the condition also obtains in a paratype (U I M N H 49224) as well as in 5 topotypes. Hence, use of the unsupported character of presence or absence of an inguinal gland for the establishment of natural taxa (at least among frogs of the genus *Eleutherodactylus*) is unwarranted.

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Taylor (1940: 499) erected the genus *Microbatrachylus* to include 2 species previously named by him and 3 described at the same time as the genus; three more have been named subsequently by him. In addition to these eight, Davis and Dixon (1957 : 146) described another species from Hidalgo. Taylor (1952) also allocated seven other species from Costa Rica to the genus, making a total of 16 species presently recognized.

The genus was diagnosed by : presence of large inguinal glands; vomerine teeth normally absent (not so in Costa Rican forms) ; tarsal fold absent ; vocal sacs absent ; ventral disc extending into thighs ; testicular sac pigmented ; small size.

The first criterion of Taylor's genus has been invalidated above, except in conjunction with other characters that might produce some unique and meaningful grouping. The second, third and fourth, are characters of the magnitude usually used to distinguish species or species-groups of *Eleutherodactylus* and other leptodactylid genera ; they cannot provide a unique combination even with the first criterion. The fifth character, length of the ventral disc, is likewise not unique to *Microbatrachylus* since at least in *E. mexicanus* specimens often have a ventral disc extending to the groin or even the thighs. The last character is not infallible, even in combination, since (1) not all specimens of *Microbatrachylus hobartsmithi* or *M. pygmaeus* have pigmented testicular and ovarian linings ; (2) *Eleutherodactylus saltator* apparently regularly possesses such linings ; and (3) Schwartz (*op. cit.*: 35) has noted that *E. zugi erythroproctus* had "jet black testes." Certainly the latter two species are not more closely related to *Microbatrachylus* than to the other members of their respective groups (*mexicanus* and *ricordi*) .

Taylor, author and primary proponent of the genus *Microbatrachylus*, regarded (1952) seven Costa Rican and Nicaraguan eleutherodactylid frogs as members of the genus. These all agree in small size and the presence of well-developed vomerine dentigerous processes with teeth. This distinctive difference in vomerine teeth leads one to believe that these seven species are not related to the Mexican species (*hobartsmithi*, *pygmaeus*, "*montanus*," *oaxacae* and *lineatissimus*) . Indeed, it appears that the Mexican species are related to the *Eleutherodactylus mexicanus* group through *E. saltator* Taylor, whereas the Costa Rican species, while forming a natural unit within themselves, are related to *Eleutherodactylus diastemus* through *Microbatrachylus costaricensis* Taylor. These two frogs agree in having a weakly defined tarsal fold (which is contrary to one of the generic diagnostic characters as given by Taylor (1940, 1941 and 1942) and in being of about the same size) . *Eleutherodactylus diastemus* attains a maximum size which is considerably smaller

than is seen in the largest Mexican (or Costa Rican) species of *Microbatrachylus*. *E. diastemus* reaches a maximum snout-vent length of 24mm. in females and only 20mm. in males. Hence, even small size will not separate Taylor's Costa Rican *Microbatrachylus* from one of the species even he (1952: 701) was content to call *Eleutherodactylus* in spite of the great similarities of the frog to another he named as a species of *Microbatrachylus*.

Thus two of the six characters Taylor (1940) used to distinguish *E. pygmaeus* and *E. hobartsmithi* generically are not useful, either separately or in combination, even in separating the eleutherodactylids into groups. The other four are not of generic magnitude, being used for distinguishing species and species-groups (and often geographic races). The characters clearly vary independently of each other. Accordingly the unavoidable conclusion is that *Microbatrachylus* Taylor, 1940 ("1939"), Univ. Kansas Sci. Bull., vol. 26 : 499, genotype *Eleutherodactylus hobartsmithi* Taylor, should be placed in synonymy with *Eleutherodactylus* Dumeril and Bibron, 1841, Erpetologie general, vol. 8: 620, genotype *Hylodes martinicensis* Tschudi.

#### THE STATUS OF THE SPECIES OF "*Microbatrachylus*"

It has long been suspected that the members of the *Eleutherodactylus rhodopis* group were, for the most part, polymorphs and chromatomorphs of a single species. The variation seen in that group is also found in *E. podiciferus* of Costa Rica and Panama as well as in the microbatrachylids related to *Eleutherodactylus pygmaeus*. Until recently, it was not realized that identical polymorphs and chromatomorphs occurred in another species-group, the *E. mexicanus* group (Lynch, in press). Goin (1950, 1954 and 1960) has shown the magnitude of color variation in a number of West Indian species of *Eleutherodactylus*. Thus in at least 5 different and largely unrelated groups of the genus very similar or identical polymorphs and chromatomorphs are now known to occur.

Duellman (1961 : 35) has clearly shown that the "species" *Microbatrachylus albolabris* Taylor, *M. minimus* Taylor, *M. imitator* and *M. pygmaeus* (*Eleutherodactylus pygmaeus*) are identical and that *E. pygmaeus* is the valid (senior) name.

The other forms of the genus which appear to be recognizable as discrete and valid taxa are :

*Eleutherodactylus hobartsmithi* Taylor : Michoacan to Nayarit.

*Eleutherodactylus lineatissimus* (Taylor) new combination. Cerro San Felipe, Oaxaca.

*Eleutherodactylus oaxacae* (Taylor) new combination. Central Oaxaca.

*Eleutherodactylus montanus* (Taylor) new combination. Mountains of northwestern Chiapas.

Davis and Dixon (p. 146) distinguished *Microbatrachylus fuscatus* from *oaxacae* by "1) shorter leg (29.8mm. vs. 35.2mm.) ; 2) outer palmar tubercle small (not large) ; 3) dorsal color in life rusty brown, not pinkish or rose color, etc." Their first character is scarcely applicable to eleutherodactylid frogs since it is a means of expressing length of leg as compared with snout-vent length. Use of relative leg lengths has been severely criticized by Duellman (1960) and myself (1965 MS, 1965 MS) . To use such characters is to invite taxonomic chaos when concerning oneself with species vs. individual variant. They had only two specimens, one of which was 17.5mm. snout-vent length. The "leg length," as used by Taylor (1940, 1941, 1942) and Davis and Dixon (1957) , is the distance from the anus to the tip of the fourth toe. Plotting the length of the leg vs. the snout-vent length in *oaxacae*, the holotype of *fuscatus* and the type-series, and 2 additional specimens of *lineatissimus*, shows this criterion to be of no value in distinguishing the three forms (Fig. 1) . One finds similar results obtain when the same graph is prepared for other species of *Eleutherodactylus*.

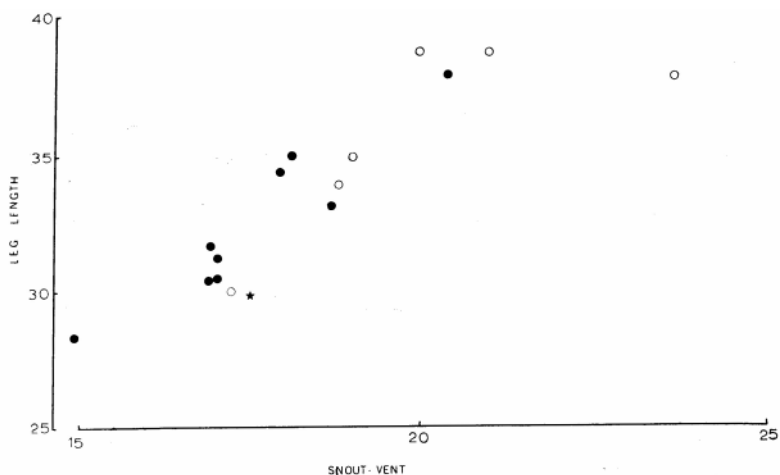


FIGURE 1. Relationships of leg length in *oaxacae*, *fuscatus* and *lineatissimus*.

With respect to Davis and Dixon's second character, relative size of outer palmar tubercle, this feature shows considerable variation. A series of eight topotypes and one topoparatype was examined. Some of the palms are illustrated in Fig. 2. The third character, color, is of no use in considering the eleutherodactylid frogs of the complex to which the "*microbatrachylus* group" belongs. The color variations, both ground color and dorsal coloration, show considerable range. Duellman (1961 :

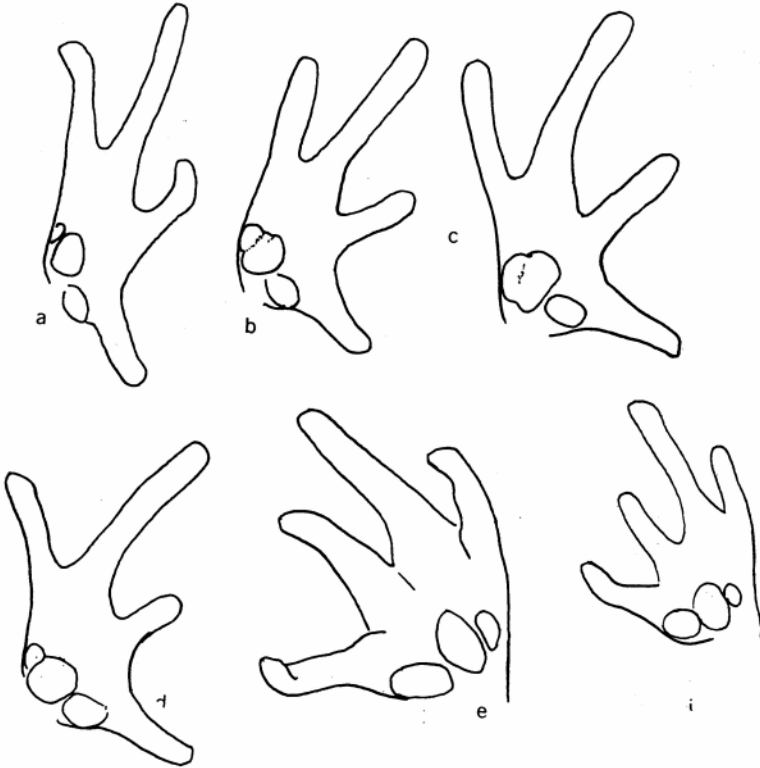


FIGURE 2. Variation in palmar tubercles in *E. oaxacae*.

33) notes a series of *E. hobartsmithi* in which 5 were typical in possessing the pinkish upper arms and anterior and posterior surfaces of the thighs whereas one was dark brown. I have collected *E. pygmaeus* in which part were pinkish and others had a yellowish to green cast in these areas.

The coloration of the holotype and paratype of *Microbatrachylus fuscatus* is the same as that seen in the Atlantic (eastern Hidalgo, northern Puebla and adjacent Veracruz) population of *Eleutherodactylus mexicanus* (Lynch, 1965). I have suggested that this population, while not presently recognizable, may be in the process of subspeciation. If a name is to be applied to this population it must be *Eleutherodactylus mexicanus fuscatus* (Davis and Dixon). In morphology and proportions (Table I), *Microbatrachylus fuscatus* is the same as *E. mexicanus*.

Taylor (1952: 662-684) treated seven species of eleutherodactylid frogs from Costa Rica which he assigned to *Microbatrachylus*. That

TABLE I. Proportionality characteristics in *Eleutherodactylus mexicanus* from eastern Hidalgo and northwestern Puebla, Mexico. Ranges and means.

	tibia-snout-vent	head length/s-v	head width/HL	tympani/HW	tympani/eye
Males (42)	0.560-0.677 (0.620)	0.344-0.482 (0.413)	0.875-1.173 (1.020)	0.205-0.342 (0.280)	0.848-1.190 (0.987)
Females (62)	0.491-0.704 (0.603)	0.347-0.456 (0.396)	0.914-1.170 (1.024)	0.121-0.229 (0.177)	0.418-0.813 (0.599)
Juveniles (50)	0.443-0.696 (0.589)	0.341-0.491 (0.420)	0.832-1.040 (0.964)	0.151-0.316 (0.200)	0.389-1.000 (0.643)
<i>Microbatrachylus fuscatus</i>	0.623 <sup>1</sup> 0.583 <sup>2</sup>	0.406 0.410	0.962 0.949	0.200 0.187	0.628 0.750

<sup>1</sup>Type, TCWC 12171, female?<sup>2</sup>Paratype, TCWC 12172, female?TABLE II. Comparison of characters in several related Mexican *Eleutherodactylus*.

	<i>E. mexicanus</i> group	"Microbatrachylids"	<i>E. rhodopis</i> group	<i>E. laticeps</i> group
Tarsus (inner surface)	Nothing	Nothing	Fold or Tubercle	Fold
Vomerine tooth patches	Weakly de- veloped	Absent or weakly developed	strongly developed	strongly developed
Webbing on foot	none	none	none or vestige	small web
Maximum size	40 mm	27 mm	38 mm	80 mm
Composition	6 spp.	5 spp.	4+ spp.	3 spp.
Testicular membrane	white (black in 1 sp.)	usually pigmented	unpigmented	unpigmented
Inguinal gland	present	present	absent?	absent
Ventral disc extends posteriorly	poorly defined posteriorly	thighs	above groin	above groin

these forms are unrelated to the *E. hobartsmithi* group (Mexican *Microbatrachylus* of Taylor) is clearly evidenced by the well developed vomerine teeth in all Costa Rican species. In this work, Taylor stressed small size and the presence of an inguinal gland in separating the genus from *Eleutherodactylus*. Neither criterion is of great value nor do they affect my arguments above invalidating the genus. Hence the seven species from Costa Rica should be referred to *Eleutherodactylus* and are : *Eleutherodactylus underwoodi* (Boulenger) new combination ; *Eleutherodactylus polyptychus* (Cope) : *Eleutherodactylus persimilis* Barbour ; *Eleutherodactylus bransfordi* (Cope) ; *Eleutherodactylus stegnegerianus* (Cope) new combination ; *Eleutherodactylus rearki* (Taylor) new combination; *Eleutherodactylus costaricensis* (Taylor) new combination.

#### GROUP RELATIONSHIPS

The "*microbatrachylus* group," redefined to include only the Mexican species, is most closely related to the *Eleutherodactylus mexicanus* group. It is separable from this group by the small size (snout-vent) of the five species of the group. The *E. mexicanus* group is likewise closely related to the *E. rhodopis* and *E. laticeps* groups. A comparison of the three recognized groups and the displaced microbatrachylids is given in Table II. The *E. mexicanus* group and the microbatrachylids agree in 6 of 7 cases; the *E. rhodopis* and *E. laticeps* groups agree in 5 of 7 and the microbatrachylids and *E. rhodopis* group agree (in part) in two cases. In no case is the microbatrachylid group unique.

Thus it appears that if the microbatrachylids were to be placed in one of the six currently recognized species groups of northern Central American *Eleutherodactylus*, it would be with the *E. mexicanus* group. However, it is probably best to set up a species group for them, the *E. hobartsmithi* group, related most closely with the *E. mexicanus* group. The phylogeny is illustrated in Fig. 3.

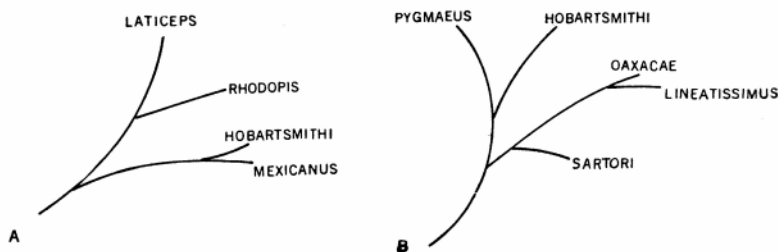


FIGURE 3. Phylogenies of the complex of *Eleutherodactylus* to which the microbatrachylids belong (A) and within the *E. hobartsmithi* group (B).

The *E. hobartsmithi* group is divisible into two sub-groups by the number of palmar tubercles. One, containing *E. hobartsmithi* and *E. pygmaeus*, has 2 palmar tubercles, the outer being absent (Fig. 4).

The other contains 3 species, one of which has parotoid glands, thereby differing markedly from the other two.

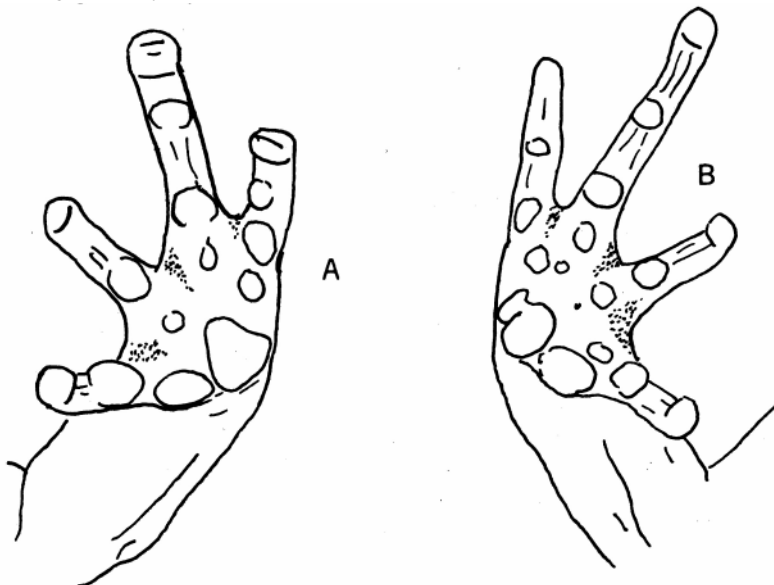


FIGURE 4. Palms of (A) *hobartsmithi-pygmaeus* unit and (B) *oaxacae-lineatis imus-montanus* unit of the group.

#### Key to Members of *E. Hobartsmithi* Group

1. Two palmar tubercles ----- 2  
     Three palmar tubercles ----- 3
2. A row of tubercles present on outer edge of tarsus ----- *hobartsmithi*  
     Outer edge of tarsus devoid of tubercles ----- *pygmaeus*
3. Vomerine teeth present (weak) ----- *lineatissimus*  
     Vomerine teeth absent ----- 4
4. Paratoid gland absent ----- *sartori*  
     Paratoid glands present ----- *oaxacae*

#### SYSTEMATIC ACCOUNT

##### *Eleutherodactylus hobartsmithi* Taylor.

*Eleutherodactylus hobartsmithi* Taylor, 1936, Trans. Kansas Acad. Sci., 39: 355.

*Microbatrachylus hobartsmithi* Taylor, 1940 ("1939") Univ. Kansas Sci. Bull., 26: 499, 501. Taylor and Smith, 1945, Proc. U. S. Nat. Mus., 95: 562. Smith, 1947, J. Washington Acad. Sci., 37: 408. Smith and Taylor, 1948, Bull. U. S. Nat. Mus., 194:55. 1950, Univ. Kansas Sci. Bull., 33:335. Maldonado in Beltran, 1953, Vida Silvestre y Recursos Naturales a lo largo de la Carretera Pan-americana : 11, 114. Lewis and Johnson, 1955, Herpetologica, 11 :



177. Duellman, 1961, Misc. Pubis., Univ. Kansas Mus. Nat. Hist., 15:33. Gorham, 1963, Canadian Field Nat., 77: 19.

*Holotype*.—CNHM 100114, near Uruapan, Michoacan, Mexico.

*Diagnosis and definition*. —A member of the *E. hobartsmithi* group characterized by: 2 palmar tubercles; tubercles on outer edge of tarsus; no inguinal black spots; tips of digits not or but scarcely expanded; parotoid gland frequently present.

*Range*. The southwestern portion of the central plateau of Mexico. Specimens examined or reported from: NAYARI T. 6 mi. S. Ixtlan del Rio; 7 mi. E. San Blas; 3 mi. N. Santa Isabel; 5 mi. SE. Ahuacatlán. JALISCO.-26 mi. W. Guadalajara; 2 mi. N. La Reso' ana; 6.7 mi. above Durazno; 1 mi. NW. Mazamitla. MI CHOACAN. Zitacuaro, Cascada Tzararacua (about 6 mi. S. Uruapan); 5 mi. from Mirador, Atzimba National Forest; 21 km. W. Ciudad Hidalgo; 29 km. E. Morelia; Puerto Hondo; San Jose de la Cumbre; Uruapan. MEXICO. —8 mi. W. Villa Victoria; Rio Chapaneal, near Aguiapan.

***Eleutherodactylus pygmaeus* Taylor**

*Eleutherodactylus pygmaeus* Taylor, 1936, Trans. Kansas Acad. Sci., 39: 352.

*Microbatrachylus pygmaeus* Taylor, 1940, Univ. Kansas Sci. Bull., 26: 500. Taylor and Smith, 1945, Proc. U. S. Nat. Mus., 95 : 563, 565. —Smith and Taylor, 1948, Bull. U. S. Nat. Mus., 194: 55.-1950, Univ. Kansas Sci. Bull., 33 : 350. Werler and Smith, 1952, Texas J. Sci., 4: 553. Maldonado, *in* Beltran, 1953, Vida Silvestre y Recursos Naturales a lo largo de la Carretera Panamericana, 118-9.

Darling and Smith, 1954, Trans. Kansas Acad. Sci., 57: 186.

Shannon and Werler, 1955, Trans. Kansas Acad. Sci., 58: 382-3.

Duellman, 1960, Misc. Pubis., Univ. Kansas Mus. Nat. Hist., 13:

56.-1961, Misc. Pubis., Univ. Kansas Mus. Nat. Hist., 15:34.

Gorham, 1963, Canadian Field Nat., 77: 19. Stuart, 1963, Misc. Pubis. Mus. Zool. Univ. Michigan, 122: 32.

*Microbatrachylus albolabris* Taylor, 1940 (*op. cit.*) : 502 (CNHM 100071, Cordoba, Veracruz, Mexico).—Taylor and Smith, 1945 (*op. cit.*) : 563-64.—Smith and Taylor, 1948 (*op. cit.*) : 54.-1950: 347. —Maldonado, 1953 (*op. cit.*) : 119. Duellman, 1960 (*op. cit.*) : 56.

1961: 34. Gorham, 1963 (*op. cit.*) : 19.

*Microbatrachylus imitator* Taylor, 1942 Univ. Kansas Sci. Bull., 28: 70-1, (USNM 115508, La Esperanza, Chiapas, Mexico).—Taylor and Smith, 1945 (*op. cit.*) : 562. Smith and Taylor, 1948 (*op. cit.*) : 55.-1950 (*op. cit.*) : 325. Maldonado, 1953 (*op. cit.*) : 119.

Duellman, 1960 (*op. cit.*) : 56.-1961 (*op. cit.*) : 34.

*Microbatrachylus minimus* Taylor, 1940 (*op. cit.*) : 507 (CNHM 100323, Agua del Obispo, Guerrero, Mexico).—Taylor and Smith,

1945 (*op. cit.*) : 562-63.—Smith and Taylor, 1948 (*op. cit.*) : 54. 1950: 33.—Werler and Smith, 1952 (*op. cit.*) : 552. Maldonado, 1953 (*op. cit.*) : 119. Darling and Smith, 1954 (*op. cit.*) : 186. Duellman, 1960 (*op. cit.*) : 56.--1961: 35. Gorham, 1963 (*op. cit.*) : 19.

Holotype. UIMNH 15125. 1 mi. N. Rodriguez Clara, Veracruz, Mexico.

*Diagnosis and definition.* —A species of the *E. hobartsmithi* group characterized by : two palmar tubercles; no tubercles on tarsus; inguinal black spots present ; tips of digits slightly expanded ; no tarsal fold; no parotoid gland ; extensive variation in color patterns.

*Range.* Extreme southern Michoacan and Mexico along Pacific slope into Guatemala. On the Atlantic slopes from north-central Veracruz to Tabasco and across the Isthmus of Tehuantepec. Specimens examined or reported from MICHOACAN. Arteaga. GUERRERO. —Agua del Obispo ; 12 mi. S. Chilpancingo. MEXICO. —9 km. W. Toluca. OAXACA. El Soledad ; Rio Sarabia, 3 mi. N. Sarabia; 3 mi. N. Matias Romero; 2 mi. N. Matias Romero; 1 km. S. Tollochita; 1 mi. N. La Princesa. TABASCO.—Teapa; 1 mi. N. Teapa. CHIAPAS. Region de Soconusco ; Cerro Bola; Colonia Hidalgo ; Las Nubes ; Cerro Ovando; Finca Juarez ; La Magnolia; Union Juarez. V ERA CR UZ. Cordoba ; 5.9 mi. W. Córdoba, Cuautlapam; 2 mi. W. Córdoba ; Barranca de Metlac; Huatusco ; 1.2 mi. SW. La Joya; Potrero Viejo; San Juan de Gracia; O j o de Agua; La Pasa; Tlalapam ; Llave ; Rodriguez Clara; Acultzingo; Teocelo (15 mi. SSW. Jalapa) , Xico ; 2 mi. NNE. San Andres Tuxtla ; Volcan San Martin; Rancho El Tular (5 mi. N. San Andres Tuxtla) ; Dos Chanegues, 1.4 mi. N. Santiago Tuxtla; 5.3 mi. W. Santiago ; near Catemaco ; near San Lorenzo ; 20 km. ENE. Jesus Carranza.

*Eleutherodactylus sartori* nomen novum.

*Microbatrachylus montanus* Taylor\*, 1942 (*op. cit.*) : 67-70.--Taylor and Smith, 1945 (*op. cit.*) : 564. Smith and Taylor, 1948 (*op. cit.*) : 54.-1950 (*op. cit.*) : 325. Maldonado, 1953 (*op. cit.*) : 119. —Davis and Dixon, 1957, Herpetologia, 13: 146. Gorham, 1963 (*op. cit.*) : 19.

Holotype. USNM 115507, Mount Ovando, Chiapas, Mexico.

*Diagnosis and definition.* —A species of the *E. hobartsmithi* group characterized by : 3 palmar tubercles; vomerine teeth absent; parotoid gland absent ; size large (27mm.) ; outer metatarsal tubercle two-thirds size of inner ; no tubercles on tarsi.

*Range.* The Sierra along the Pacific slope of Chiapas. Specimens examined or reported from CHIA PA S. Mount Ovando ; La Esperanza (near Escuintla) ; Las Nubes; Salto de Agua.

*Eleutherodactylus lineatissimus* Taylor.

*Microbatrachylus lineatissimus* Taylor, 1941, Proc. Biol. Soc. Washington, 54. Smith and Taylor, 1948 (*op. cit.*) : 54.-1950 (*op. cit.*) : 339. Maldonado, 1953 (*op. cit.*) : 147. Davis and Dixon, 1957 (*op. cit.*) : 146.—Duellman, 1960 (*op. cit.*) : 56. Gorham, 1963, (*op. cit.*) : 19.

*Holotype*.—CNHM 100036, Cerro San Felipe, Oaxaca, Mexico ; 7000-8000 feet elevation ; July, 1940 ; E. H. Taylor and R. C. Taylor, collectors.

\*This taxon is a junior homonym of *Eleutherodactylus montanus* Schmidt, 1919 (Bull. Amer. Mus. Nat. Hist., 41: 519) .

*Diagnosis and definition*. —A species of the *E. hobartsmithi* group characterized by : three palmar tubercles ; no parotoid gland ; vomerine teeth small, but present, patches widely separated ; seven dorsolateral and dorsal folds.

*Range*. Southern portion of Oaxacan plateau. Specimens examined from OA Xi/ CA. Cerro San Felipe ; El Soledad.

*Remarks*. It is entirely possible that this species is conspecific with *E. oaxacae*. The relationship of this form of *oaxacae* appears to be equivalent to that of *E. venustus* or *E. sanmartinensis* to *E. rhodopis*, but more specimens as well as field observations are needed.

*Eleutherodactylus oaxacae* ( Taylor )

*Microbatrachylus oaxacae* Taylor, 1940 (*op. cit.*) : 540. Taylor and

Smith, 1945 (*op. cit.*) : 564. Smith and Taylor, 1948 (*op. cit.*) :

54.-1950 (*op. cit.*) : 339. Maldonado, 1953 (*op. cit.*) : 117.

Davis and Dixon, 1957 (*op. cit.*) : 146.—Gehlbach and Collette,

1957, Herpetologica, 13 : 227. Gorham, 1963 (*op. cit.*) : 19.

*Holotype*.—CNHM 100001, Cerro San Felipe, Oaxaca, Mexico, collector E. H. Taylor.

*Diagnosis and definition*. —A species of the *E. hobartsmithi* group characterized by : three palmar tubercles, outer variable in size ; no parotoid glands ; no vomerine teeth ; small size (18mm. or less) ; dorsal and dorsolateral folds, if present, indistinct and less than seven.

*Range*. Currently known only from the highlands of Oaxaca, Mexico. Specimens examined or reported from OAXACA.—Cerro San Felipe.

## SUMMARY

The values of some characters in classifying Mexican eleutherodactylid frogs are questioned and found to be of little use in establishing genera. The genus *Microbatrachylus* Taylor is placed in the synonymy of *Eleutherodactylus* Dumeril and Bibron.

Nine forms have been described as members of the genus *Microbatrachylus* in Mexico ; only 5 of these can now be accepted as rep-

representing discrete and natural taxa. The status of one of these (*lineatissimus* us) is further questioned. *M. fuscatus* Davis and Dixon is based upon 2 juvenile (females ?) of *Eleutherodactylus mexicanus*. The forms currently recognized are placed in a separate species group, closely allied to the *E. mexicanus* group, viz. the *E. hobartsmithi* group. They are *E. hobartsmithi*, *E. pygmaeus*, *E. sartori*, *E. oaxacae* and *E. lineatissimus*. The latter three form a natural unit as do the former two on the basis of number of palmar tubercles. *Microbatrachylus montanus* (= *Eleutherodactylus montanus*) Taylor is renamed *E. sartori*. Specific name derived from *sartor* L.=taylor in loose reference to Dr. Edward H. Taylor.

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